

REMARKS

The subject invention relates to a new method of using laser light to treat the tissue. Laser energy, including light from an Nd:YAG laser, has been used for tissue treatment for quite some time. For example, Nd:YAG laser energy has been used to treat vascular lesions and for hair removal. Most often, the Nd:YAG laser was configured to generate relatively long pulses, in the millisecond regime. Nd:YAG lasers have also been operated in the Q-switched mode, typically generating pulses in the nanosecond regime, for procedures such as tattoo removal. By contrast, there has been less investigative work using Nd:YAG lasers with pulse widths in the microsecond regime.

The inventors herein have developed a procedure for an Nd:YAG laser that has been used to successfully treat certain tissue problems, such as skin redness. This approach uses microsecond laser pulses, each pulse having a very high energy or power. As recited in amended claim 103, each pulse should have a power of at least 10 kilowatts. Preferably, each pulse should have a power of as much as 40 kilowatts.

As best described in the specification at page 19, line 26 to page 20 line 23, in the method of the subject invention, the handpiece which is used for delivering the laser pulses is spaced away from the tissue at a distance of a few centimeters. As can be appreciated, since the handpiece is spaced from the tissue, there is no surface cooling as is used in many prior applications. The handpiece is moved back and forth over the area to be treated, typically a few square centimeters. During the time the handpiece is moved over the target region, a series of laser pulses are delivered to the tissue. In accordance with claim 103, at least 400 of these high power pulses are delivered. This treatment has proved effective at reducing the redness in tissue and has shown some success in reducing wrinkles.

Applicants' counsel wishes to express his appreciation for the courteous telephone discussions with the Examiner where the prior art and a proposed amendment to claim 103 was discussed. In particular, Applicants have amended claim 103 to specifically recite, as part of a method step, the treatment of the tissue with narrowband radiation having a wavelength of 1.06nm corresponding to the principal wavelength of an Nd:YAG laser. Second, Applicants have amended claim 103 to make it clear that the treatment is not intended to ablate the skin. It is believed that the

claim 103, when taken as a whole, is not obvious in view of the many prior art references discussed with the Examiner.

In the Office Action, the Examiner relied on four different references including Durkin (2003/0036749); Eckhouse (5,776,175); Furumoto (6,273,883); and Dewey (5,558,666).

Durkin is directed to a device for treating acne. Durkin is deficient in that it fails to disclose the unique pulse width limitations of claim 103. The shortest pulse widths appear to be on the order of about 50 milliseconds. In addition, while Durkin does mention Nd:YAG lasers, it is only as part of a large group of lasers operating at a variety of wavelengths. Clearly, Durkin did not appreciate the particular benefits of the 1.06 micron wavelength along with the other limitations of amended claim 103.

Eckhouse '175 is directed to a device that employs a flashlamp for treating cancer. Since Eckhouse is not related to a laser treatment, any discussion of flashlamp pulse duration is not particularly relevant to an analysis of the patentability of claim 103.

Furumoto relates to an alexandrite laser having a wavelength in the 755nm range. Further, the pulse widths are in the millisecond range.

Dewey is actually directed to a lens system in a handpiece. Dewey gives an example of a treatment regime using a carbon dioxide laser. Such lasers operate at 10.6 microns, drastically different from the claimed 1.06 micron wavelength. In particular, the absorption in tissue at 10.6 microns is much higher than at 1.06 microns and therefore carbon dioxide lasers are often used for ablating tissue.

During the telephone discussions with the Examiner, three other references were considered. All three of these references were cited in the original Information Disclosure Statement filed by the Applicants.

Yarborough (5,911,718) relates to a frequency doubled Nd:YAG laser used for treating vascular lesions. As can be appreciated, the 532nm wavelength of Yarborough is quite different from the claimed 1.06 microns wavelength.

Eckhouse (5,964,749) discloses a variety of light sources for wrinkle removal including Nd:YAG. However, no specific pulse widths are disclosed.

Kreindel (6,387,089) is a continuation-in-part of Eckhouse '749. At column 6, line 5, Kreindel suggests using a pulse width of 1 to 300 milliseconds and preferably 10 to 100 milliseconds, both outside the claim range of between 100 microsecond to 1 millisecond.

There is no doubt that each of the various limitations of claim 103 can be found in individual references spread out over the many references related to tissue treatment. Nonetheless, there is no single reference which teaches all of the limitations of amended independent claim 103. Further, there is no set of references, which one skilled in the art would have been motivated to combine to reach the method of claim 103.

Based on the above, it is respectfully submitted that amended independent claim 103 defines patentable subject matter and allowance thereof, along with the claim depending therefrom is respectfully requested.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing Docket No. 658312000800. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

By /Michael A. Stallman/
Michael A. Stallman

Registration No.: 29,444
MORRISON & FOERSTER LLP
425 Market Street
San Francisco, California 94105-2482
(415) 268-6003